

[SQUEAKING]

[RUSTLING]

[CLICKING]

NORVIN
RICHARDS:

So first some review. Last time, we were doing "unlockable," and I was trying to convince you that it's useful to think of words, at least some words, as consisting of multiple parts. We're calling these parts morphemes.

And there's this process of combining morphemes, we called it merge, where you take two things, two morphemes-- not necessarily two morphemes, two things, and you put them together and you make a new thing. So you can take a morpheme like "un-" and a morpheme like "lock," and you can put them together to make a verb "unlock."

And so I just corrected myself. Sometimes the two things you take are morphemes, but sometimes they are the results of previous instances of merge. So you can also take this thing "unlock" that you've made as a result of merging "un-" and "lock," and merge that with "-able" to get you "unlockable."

That procedure that I just ran through is what gives you the tree on the left. So the trees there are meant to be representations of the order in which you did things. So the tree on the left is a representation of two merge operations.

First, merging "un-" with "lock," and then merging "-able" with "unlock," giving you an adjective that means a functioning lock, able to be unlocked. This is all stuff we went through last time.

And this is why the word "unlockable" is ambiguous because, well, there are two ways that you can assemble it, and the two ways give you different interpretations. Are there any questions about any of that? This is all stuff we did last time.

OK. Yeah, OK. All right. So that's what we were doing with "unlockable."

And then we also said, and we talked about this a little bit, there need to be some statements about what's called allomorphy. So sometimes you don't just peacefully put morphemes next to each other, they change as a result of being next to another morpheme. The result is what's called allomorphy. So a morpheme can have allomorphs, different forms that it has, depending on its environment.

Sometimes our statements of allomorphy will have to be very specific to the morphemes in question. So we'll say that when you merge "go," together with past tense, that the result is "went." And that's not the result of a general process, that's something you just have to look up when you look up the word "go" in English.

Or that when you add "-ity" to something ending in "-ic," like "electric," that the "k" sound at the end of "-ic" will be pronounced like an "s." You get "electricity" and not "electric-ity." So sometimes these are statements about particular morphemes and what they do when they combine.

Other times, we'll be able to do allomorphy via more general rules. So we did spend some time talking about Polish where we convinced ourselves that it's useful to think that Polish has a general rule-- which we'll circle back and talk about more later on-- a general rule that says that if you have a "g" at the end of a word, it becomes a "k." So in Polish, there are various words that when you pronounce them, they seem to end in "k," and then we saw that if you add the suffix so that the "k" is no longer at the end of a word, sometimes it really was a "k," in which case it stays a "k."

But sometimes it was a "g" concealing itself as a "k," and it reveals its true self as a "g" when you add the suffix. Yep, this is a crash course in Polish. Now you know as much about Polish as I do, which is not much.

Any-- this is all review. Does this all make sense? No questions?

All right. So one of the things that we did several times-- in fact, I casually did it on the last slide-- was to use words like "noun" and "adjective." And I thought we should just take a second to talk about what we mean when we say words like that. I bet that a lot of you were taught what nouns and adjectives are.

But it's possible that some of you were not, and I know that some of you are not native speakers of English, and this might not be high on my list of words to learn, if I were learning another language. Wow, my power cord just turned into a pretzel. This is pretty impressive. I didn't know they did that.

So I wanted to just talk briefly about that before we go any further into morphology. What's a noun? You guys, maybe some of you were taught what a noun is. Yes.

An object or a thing?

An object or a thing? Yeah. Anybody else taught things like that about what nouns are? Yeah. Yes.

A signifier of a particular matter.

A signifier of a particular matter. Huh, I like that. That's a very classy definition. Yes?

AUDIENCE: [INAUDIBLE]

NORVIN RICHARDS: Yeah. So I was taught that, a person-- actually, I was taught a person, place, or a thing, yeah. And then later, I learned that kids today were learning that it was also idea. I guess on the idea that ideas are not things, which, I guess, they're not.

So these are all definitions of "noun" that make reference to the kinds of things that nouns mean, right, so that they refer to people, or ideas, or things, or-- yeah, this is what nouns are. And that's fine if that works for you. That might be the best way for you to think about nouns.

Here's another way of thinking about it, which you can use if you want to if you're ever confused about whether something is a noun or not, if you find yourself as you go further in linguistics, every so often, you will-- yeah. Part of the point of higher education is to make you, like, doubt yourself and be unhappy, things that you were sure that you understood, all of a sudden, you're like, wait, do I really deeply understand that? And it's meant to undermine your emotional security, basically, that's what education is for.

So here's another way of thinking about what nouns are. If you're making a sentence, let's say, putting a sentence together is like putting together any other complicated thing with lots of parts. Take your favorite example of that, a jigsaw puzzle, or a model airplane, or whatever, or IKEA furniture, if you've ever assembled that.

If you're ever assembling things like that, they have different parts with different shapes that go in different places, right? If you're making a model airplane, there are the wheels, and the wheels go, well, where the wheels go. Or if you're making an IKEA chair, there are various boards, but then there are also screws and-- right? There are things that you're supposed to put in particular places.

And you could name those things by their shapes, right? So you could talk about the wheel on an airplane, or the edge piece on a jigsaw puzzle. And you can also kind of name them by their functions. If you weren't sure what an edge piece was, well, it would be the piece that goes on the edge of the jigsaw puzzle, the one that goes on the outside.

And I guess kind of similarly, "noun"-- when we say that something is a noun, what we mean is that it's something that goes where nouns go, kind of like an edge piece. It's a piece that goes on the edge. So if you're putting a sentence together, there are parts of the sentence where nouns belong.

And noun is just a name for the class of things that can go in those places. So, I mean, for example, if you can grammatically finish a sentence with a single word, a sentence like, we are talking about (blank), or we are talking about "the" (blank), then it's a noun. And I'm saying this partly as a challenge, try to show me that I'm wrong. Yes.

AUDIENCE: [INAUDIBLE].

NORVIN RICHARDS: You don't, you're right. So we are talking about "him." So "him" gets to count as a noun. And we would want pronouns to be a particular subspecies of noun.

That might not be such a bad result. Yes.

AUDIENCE: Wouldn't names also be able to fit in that?

NORVIN RICHARDS: Yeah. So we're talking about Mary. "Mary" would be a noun. And that's probably right, "Mary" should probably be a noun. Yes.

AUDIENCE: In a sentence we are talking about running, there's a word for that, isn't there?

NORVIN RICHARDS: It's a gerund, yeah. So this is one of the places where you're supposed to be filled with emotional angst. Wait, "running," it's got "run" in it. That looks like a verb.

But it's a verb that's been converted into a noun so that we can put it in this sentence. That's what a gerund is. It's a name for a verb that's been turned into a noun. Yeah, good point. Yeah.

OK. So I invite you to try to come up with sentences like this for your favorite parts of speech. Here's another one. If you can grammatically finish a sentence like, "I consider her (blank)," and the result is a sentence, that means, "I think that she is (blank)." So I consider her tall, or brilliant, or whatever, then that's an adjective. The thing that's in the blank.

Sometimes the sentences will not make a whole lot of sense. So "I consider her autumnal"-- It's not clear what that means. But if you compare it with "I consider her run," yeah. So "I consider her run" just makes no sense at all. Whereas "I consider her autumnal." I sound deeply poetic, I guess. And you wonder what I mean by that. Yeah.

But-- so "autumnal" is an adjective, "run" is not an adjective. And I have this bit about that it has to mean, "I think she is (blank)," because you can say things like, "I consider her often." That means "I think about her often." "Often" is not an adjective, because if I say I consider her often, I don't mean I think that she is often. Yeah. That's not what that means. So "often" is not an adjective. It's an adverb, actually, and we'll talk about that.

I'm not going to make you go through this for all the parts of speech, but this is an interesting exercise. Yes.

AUDIENCE: Is this the answer to our problem?

NORVIN Uh-huh.

RICHARDS:

AUDIENCE: Yes. It's also [INAUDIBLE], I think it's coming [INAUDIBLE].

NORVIN I consider her coming. I'm full of doubt and angst. So there is a parse of that, I consider her coming, which

RICHARDS: means, I am thinking about the fact that she is coming. It can mean that, I think.

I consider her-- can it mean I consid-- I believe that she is coming? I know there are other English speakers in this room. What do you guys think? Yes.

AUDIENCE: I know there's like that one part of the game not really ever [INAUDIBLE]

NORVIN Yeah.

RICHARDS:

AUDIENCE: [INAUDIBLE].

NORVIN Oh, yeah. Yeah. So-- but I think-- I'm sorry, what's your name? Is it Ivana? No. Sorry, what is your-- what is your--

RICHARDS: you were asking about "I consider her coming" just a second ago. Yeah.

AUDIENCE: Oh, Vlada.

NORVIN Sorry, Vlada, I got you wrong, sorry. Vlada is asking about whether it's possible to have a form like "coming" as an adjective here. Forms like "coming" can be adjectives. So you can say things like "the coming century," right, where "coming" is being used as an adjective.

So I said a second ago, "running" can be a noun, right? We're talking about "running." This is one of many tricky things about English. Forms of verbs that end in "-ing" can be nouns, and then we call them gerunds. They can also be participles, and then we call them adjectives.

Sorry, they can also be adjectives, and then we call them participles. Let me do that again. "-ing," if you add it to a noun, there's an "-ing" that you add to a noun that makes it into a-- sorry.

There's an "-ing" that you add to a verb that makes it into a noun. That's when it's a gerund, like in "We're talking about running." There's an "-ing" that you add to a verb that makes it into an adjective, and that's a present participle. That's the kind of thing Vlada is asking about.

So "the coming century," or "a running man," those 'running's are-- those "-ing" verbs are adjectives, they're participles. Sort of like, if we go back to "un-" we convinced ourselves that "un-" has a couple of different forms, that it can attach either to an adjective, or to a verb, right, with slightly different meanings. Similarly, "-ing" has several different guises. It can be a couple of different things.

English really needs more morphemes. We have several morphemes that are pronounced the same way. Not every language does that. There are plenty of languages that have just different forms for gerunds and participles.

OK. All right. So this has just been an exercise in trying to convince ourselves that we know what we're talking about when we're talking about things like nouns and adjectives. And like I say, I won't make you do this for every part of speech. But if you want to annoy your friends back in the dorm, trying to come up with sentences like this might be an interesting exercise. Yeah. Interesting for me, maybe not for them.

OK. Questions about any of that? This has just been so that if anybody heard all this talk about nouns and adjectives and was wondering what the heck are we talking about exactly, that is what we are talking about exactly.

So we've been talking now about morphology for a little while. And we have mostly been talking about language specific properties. So we've been saying a morpheme with a given meaning is pronounced differently in different languages, so we started with cats.

We convinced ourselves that if we wanted to look for things that were universal about language, figuring out that the word for cat is "cat," that's clearly not universal. Every language has a different word for cat. So morphemes with a different meaning can be pronounced differently in different languages.

Morphemes can be various types. They can be prefixes, or suffixes, or infixes, or other things. So those here are three verbs in English, Lardil, and Tagalog, that all mean "danced." They all have-- consist of a verb, along with another morpheme that indicates past tense. That morpheme is a suffix in English, but it's a prefix in Lardil, and it's an infix in Tagalog.

And morphemes can be bound or free. So here are some new examples of that. This is, again, a point of cross-linguistic variation.

So in English, a phrase like "in my hand" consists of three words, three free morphemes. But in Turkish, it consists of a root plus two bound morphemes. So there's the word for hand, to which you are adding suffixes that mean things like "my" and "in." Yeah.

Anybody here speak Turkish? Cool. Is this true? Am I lying? OK, good.

Similarly, in English, a sentence like "I bought a bed" consists of four free standing words. In Mohawk, it consists of one word. So there's a verb "buy" that is combining with various things, including a morpheme that means "bed." So the object becomes part of this long verb.

Anybody here speak Mohawk? OK, good. So please just believe me, yeah. This is how Mohawk works. This is a process called noun incorporation. It's not obligatory in Mohawk, but it's an option that you have.

So languages can vary with respect to how their morphemes are pronounced, whether they're prefixes or suffixes, or other things, and whether they are bound or free. Languages are sometimes informally classified by how likely their morphemes are to be bound. And when I say that they're informally classified in this way, what I mean is, it's probably hopeless to try to tightly define what this means.

But this is a quick and dirty classification that you will hear people use. There are languages out there-- Mandarin is the poster child for this-- that just are not into bound morphemes. So all of the morphemes are free. They don't have to be attached to anything.

So in Chinese, "he ate the meal" consists of four free standing words, doesn't have prefixes or suffixes, mostly. There are a few things in Mandarin that people argue about whether they might be suffixes or not.

So like you can make pronouns plural by adding a "men" after them. So "wo" is "I" and "women" is "we." So you add the "men" and you get a plural version. It's a candidate for a bound morpheme, but it's certainly a language that doesn't have a lot of bound morphemes.

Opposite extreme are languages like Mohawk or Wampanoag. This is the language that is spoken by the traditional owners of a lot of Eastern Massachusetts, including, arguably, the place where we're standing right now. These languages are called polysynthetic. They are really, really into bound morphemes.

So things that would not be bound morphemes in English are bound morphemes. This is an example from a letter that was written in the 1600s by a missionary to the Wampanoag on Martha's Vineyard, a guy named Experience Mayhew, because they knew how to give names in the 16th-- 1600s. He was asked, apparently, by the person he was writing the letter to to give him the longest word that he could in Wampanoag. And this is what he came up with.

It means "our very skillful mirror makers." And as you can see, it consists of lots and lots of morphemes all piled on top of each other. He kind of cheated by putting "mirror" in the middle of that. So "mirror" itself is a morphologically complex word in Wampanoag. It means "device for looking at your reflection."

Yeah, so look, "reflection device," [NON-ENGLISH], is the word by itself for "mirror." So he sort of gave himself a head start by putting that in the middle of the word. Yeah.

AUDIENCE: Is there any sort of connection between, I don't know, geography of where the language is spoken versus whether it's the language tends to be isolating?

NORVIN RICHARDS: Which of these things it is? So the question was whether there's any connection between geography and whether a language is isolating or polysynthetic. These things kind of run in families, in language families.

So there are a bunch of isolating Polynesian languages, for example. There are a bunch of polysynthetic. Wampanoag is Algonquian. Mohawk is Iroquoian. Those language families tend to be polysynthetic. And so because language families are confined to particular places, there's some kind of connection to where you are.

I think that might be as far as it goes, actually. Yes.

AUDIENCE: Does "polysynthetic" refer to the same group of languages as "agglutinative"?

NORVIN
RICHARDS: No. "Agglutinative" means something slightly different. We'll get to "agglutinative" in just a second. Yeah, that's a very good question. Other questions you want to ask? OK.

I think we have "agglutinative" coming up. Yeah. So this is another, again, informal way of classifying languages. If we were having tests in this class, I would never test you on the meanings of these terms because they're fairly imprecise. But they're useful for giving people a basic idea of what you're looking at.

Agglutinative language is-- this is another way people sometimes compare languages. Agglutinative languages are languages in which there are morphemes-- they're typically a bunch of morphemes that are bound, and they are easy to separate from each other. So Turkish is the poster child for an agglutinative language.

You've got a verb, and then you have a bunch of suffixes on the verb. And making the cut between one suffix and the next is pretty straightforward. There aren't a lot of fancy morphological changes that happen as a result of these morphemes coming in contact with each other.

And each of the morphemes has a pretty simple meaning. They mean things like, each other, or cause, or past. Yeah. Yes.

AUDIENCE: So allomorphy wouldn't be the present [INAUDIBLE].

NORVIN
RICHARDS: So, not in-- yeah, not the kind of allomorphy that causes you to wonder where one morpheme starts and the next begins. So there are languages-- the polysyn-- so there are polysynthetic languages. There are languages that have lots and lots of morphology on their verbs. Navajo is a very good example. We'll see some Navajo examples later, in which there are many morphemes but they tend to squash into each other. And you have to do a lot of analysis to figure out where one starts and the next begins-- where one stops and the next begins. Did you have a question?

AUDIENCE: No.

NORVIN
RICHARDS: Yeah, OK. Further questions? OK.

So agglutinative and sort of the opposite of agglutinative, people talk about "fusional," or "inflectional" languages. These are languages that have morphemes, and the morphemes squash a bunch of bits of meaning together in one small space. So these Russian nouns, for example, end in vowels, which indicates the grammatical gender of the noun, and also its number, and also its case.

And you aren't going to be able to divide that vowel into parts, right? So the "oo" at the end of [NON-ENGLISH] means feminine and singular and accusative. And the "uh" at the end of [NON-ENGLISH] means feminine and plural and accusative.

And it's hopeless to try to find a part of that suffix that's the part that means singular or plural, right? It's just all in one big spot. Yeah.

AUDIENCE: Is this the case with endings in Spanish?

NORVIN Say it, again.

RICHARDS:

AUDIENCE: Is this the case with endings in Spanish?

NORVIN Oh, I see. You're talking about the verb endings in Spanish?

RICHARDS:

AUDIENCE: More like [INAUDIBLE].

NORVIN Oh, I see. So this is why, I think I said-- so she's asking, is this true for Spanish nouns which end in endings like "-

RICHARDS: os" and "-as," right, which indicate both gender and number sometimes. And in those particular cases, you could try to convince yourself that the "oh" indicates masculine, and the S indicates plural, right? In lots of cases, this is why I said we're never going to test you on this kind of thing because this classification is really a classification of how easy is it to make divisions between morphemes and make breaks in places?

And the answer is, sometimes very easy-- that's Turkish. Sometimes impossible, that's Russian. And Spanish is somewhere in the middle. It's more maybe for that particular case, it's more on the agglutinative side. Maybe there's a break that you can make.

But, yeah, so asking questions like, how easy is it? This is no way to do science. Yeah. Other questions? Yes.

AUDIENCE: [INAUDIBLE].

NORVIN Oh, animate. Where? Oh, here. It stands for the fact that Russian masculine accusatives take "ah" only if they refer to things that are alive. Right. So, yeah, that's what it means. Yeah.

RICHARDS:

So there's syncretism in Russian between the accusative and the genitive, I guess it is, just for animate nouns and not for inanimate masculines. Yeah. Any questions about this? OK.

All right. OK. So I'm talking about lots of things that are language specific. And I just wanted to-- this is going to be a topic of conversation throughout the class. When we are looking at things, how much time are we spending looking at ways in which languages are different, and how much time are we spending trying to figure out the basic rules, the things that all languages have in common?

Both of these are important things for linguists to do is try to understand both the variation and the core of common thread that all-- connects all these languages together. I just wanted to try to convince you that even in morphology, which is what we're starting with, there are some things that maybe are reliable cross-linguistically. So here's a Georgian verb and a Turkish verb.

I don't know either of these languages so I had to pick examples that had a different verb at the bottom. So in Georgian, you've got "paint." And in Turkish, you've got "open."

But otherwise, these verbs are the same. So the Georgian one means, "I will have him paint it." And the Turkish one means, "I had him open it."

OK. They aren't the same. They're different tenses. But they're both about causing someone to do something to something. There, they have that in common.

And they have some other things. And they're different in other ways, too. So the Georgian verb is preceded by several prefixes. The Turkish verb is followed by several suffixes.

But here's what they finally have in common. The red affix is merged after the blue affix. So the affix that means "cause" is the first thing that's merged with the verb in both of these languages. And the affix that means first person singular, "I," as the subject, is merged later in both of these.

Now, in Georgian, they're both prefixes. In Turkish, they're both suffixes. They're not pronounced the same way, right? "Cause" in Georgian is "a." "Cause" in Turkish is "tir." But they do have that property in common, that the order in which you combine these morphemes is the same for these two otherwise fairly different languages.

And that's a pretty reliable thing, so what's sometimes called derivation morphology, which includes things like all the morphology we were talking about, that converts things from nouns into verbs or from verbs into adjectives or whatever all else, and also things like causative, that change the number of participants in a verb, so by adding someone who is causing a verb to happen. That type of morphology tends to be merged earlier than what's sometimes called inflectional morphology, the kind of morphology that indicates things like who's doing what to whom and when. That's a moderately reliable fact.

Or similarly, there are various places where a pair of expressions can differ in all kinds of ways, including whether you're looking at prefixes or suffixes. So here's Swahili for "you hit" and German for "you put." And abstracting away from the fact that one of them is hitting and the other is putting, in Swahili, those are prefixes, in German, they're suffixes. But the order in which everything is merged is the same.

In English and Turkish, "in my hands," and the Turkish version of that, "ellerimde," the Turkish morphemes are bound, the English morphemes are free. But the morphemes are being merged in the same order. So there's some hope for the idea that there is some core that these languages all share that we want to try to understand what is it that determines the order in which you do your merge operations.

If you thought I was going to answer that question for you today, then I'm about to disappoint you. But that's a question that we're going to want to keep in mind going forward. Yeah?

AUDIENCES: Does this have anything to do with the fact that, at least in English, there's like a certain way that you can say-- like, if you have a list of adjectives describing a noun, you say them in a certain way. So you say like "the big bad dog," but not the "bad big dog?"

NORVIN
RICHARDS: Bad big dog. Yeah, so that's a very nice point. When you have a bunch of adjectives in English, they tend to go in a particular order. That's right. And actually, there's a very articulated order. It's got like five slots for the adjectives and the order that they go in.

The other cool thing about it is that among languages that put their adjectives before the noun, if they have any rules for the order of the adjective, that's the rule. So that's the only kind of rule that there can be. For languages that put their adjectives after the noun, if they have any rules for the order, there are two kinds of rules.

So if you number the adjectives that go before the noun in English, if you say they go in the order 1, 2, 3, 4, 5, if you're a language that puts your adjectives after your nouns, there are only two kinds of languages like that. There are languages in which the order is 1, 2, 3, 4, 5, so you get noun, 1, 2, 3, 4, 5. So it'd be like you say "house big black," and you can't say "house black big."

You say, "A little green Japanese carving knife," right? And in these languages, you would say "A knife little green Japanese carving." So you have the adjectives in the same order they'd be in English, but after the noun. That's one kind of adjective-after-the-noun language. And the other kind is just the one that has the mirror image of the adjectives. So in the languages of the world, there are, I think, three kinds, which is kind of interesting. Yes?

AUDIENCE: Why is it sort of right to say "big black house" but not "black big house?"

NORVIN
RICHARDS: Hey, good question, yes. Yeah. There are linguists working on that, yes. And that's actually basically her question, your question, from just a second ago, right? So there are conditions on the ordering of the adjectives. And yes, we want to try to understand what those are.

All of you are eventually going to want to write a research proposal in which you try to tell me that you're going to figure something out. I can give you some things to read that are attempting to figure out the answer to that question. But yeah, that's a research topic. Other questions? Cool, all right.

So yeah, this is just me saying again what I said. So what those trees have in common is that if A is higher than B in one tree, the same A is higher than the same B in the corresponding tree, where by "higher," we mean higher in the tree, added later in the series of merge operations. That's what we mean.

Lots of questions, like the question that both of you asked-- what's going on with order of adjectives, or how come these things have to be merged in these orders in all of the trees that I'm showing. And I'm not offering to answer those questions for you today. These are some of the central questions of syntax, and we'll try to understand them eventually. OK, yeah?

OK, so we started off by saying there are at least two imaginable kinds of lexicons if we're going to make a list of everything you know about your language, one that has in it entries like "teach," "teacher," "teachers," "teaching," and "mine," "miner," "miners," "mining," and so on, and another one that instead has-- so that first lexicon consists entirely of words. If you look at an actual dictionary, that's the kind of lexicon you're probably used to seeing.

But we've been fooling with the idea that your mental lexicon is not organized that way. What your mental lexicon has in it is morphemes. So it has "teach," and "mine," and suffixes like "-er" and "-ing," and rules for how morphemes can be combined with each other, and what the result is, and what happens when morphemes combine with each other. That's the kind of model of how language is put together that we've been playing around with. Yeah? OK. All right.

Yes, so just to give these theories names, nice nonjudgmental names, we're going to call them the wrong theory and the right theory. And evidence that the right theory is right, that we played around with-- for one thing, I asked you to take pity on the plight of the Nimborans. These are these people in Papua New Guinea whose verbs each have 27,000 forms. If we make their lexicons have every verb form in it, their lexicons are going to be very large. They will have no time to do anything other than sit around and remember verbs, whereas if we're willing to allow them to break words into morphemes and put those in their lexicons, then they will have lexicons of a reasonable size.

And we saw lots of evidence that people manipulate morphemes, including the fact that you can apply morphemes to new words. So if I tell you I've invented a new thing, it's called a "wug," and then I show you another one, then you will call the two things "wugs." This is a classic experiment by Jean Berko Gleason, which she did this with small children and they did what you would expect them to do-- and so on.

Yeah? Good? People are willing to believe in morphemes? Excellent. OK.

I want to spend some time, then. The problem set that is now finally available to you has on it a morphology problem. So it gives you a bunch of data from a language. The language is Inupiaq, which is a language spoken in the Arctic, in Alaska, in the coast of Alaska. And it asks you to go through and try to find all the morphemes and figure out rules for how they combine.

We've already done a little bit of that kind of thing in this class, but I wanted to do another problem like this. And this problem is going to introduce some new issues and things for you to think about as you're doing morphology. So I want to go through these.

These data are from a language called Lardil, which I think I've mentioned before. It's a language spoken in northern Australia which I've done in field work on. It's a language that has inflection on its nouns. Its nouns get inflected for case. So they have suffixes indicating case.

And if you're not sure what I meant by that, here's what I mean. Nouns have little markers on them telling basically whether they are the subject or the object of a verb. So if you're the subject of a verb, you're in the nominative case. And if you're the object, then you're in the accusative case.

If you study-- English does not have so much of this, except on our pronouns. If you study lots of other languages, if you try to learn Russian, or Japanese, or Latin, or many other languages, you've had to learn about case. Yeah? So Lardil has case.

Here are a bunch of nouns in their nominative and accusative forms. So you've got "mela," which means "seawater." It also means "beer," I guess on the theory that they're both foamy things that make you sick if you drink too much of it.

"Mela," "barnga," "thungal," "ketharr," and "miyar," those are the Lardil nouns in their nominative forms. And then you've got their accusative forms there, which I won't read to you. What's the accusative morpheme?

AUDIENCE: "-n."

NORVIN "-n." Joseph? "-n," yeah. Oh dear, I'm going to have to do this writing-everything-twice thing again. I really need

RICHARDS: to learn how to manipulate the screens better.

So the accusative suffix is "-n." Say it again, the accusative suffix is "-n." Does anybody find any examples that are a problem for that? Yes?

AUDIENCE: The ones that have "-in."

NORVIN Yeah, so some of them have "-in," right? Like "tree," and "river," and "spear," I think. What determines whether
RICHARDS: the suffix is "-n" or "-in"? Yes?

AUDIENCE: The last letter.

NORVIN The last letter of the nominative, yep.

RICHARDS:

AUDIENCE: "a" or not "a."

NORVIN Can you be more specific? What determines whether it's just an N or an I-N?

RICHARDS:

AUDIENCE: If the noun ends in "a," then it ends with "-n." If it ends in not "a," then it's "-in."

NORVIN That's true. All of these examples, it ends in an "a."

RICHARDS:

AUDIENCE: Are they vowel versus consonant?

NORVIN Yeah, so we might bravely say that it's about vowels versus consonants, and we'd be right. But you're absolutely
RICHARDS: right. I haven't shown you that.

So the fact is, after a consonant, you get "-in," and after a vowel, you get "n." I'm going to say that again over here. After a consonant, you get-- sorry, after a vowel, you get "-n." And after a consonant, you get "-in." OK? Good. So far, so good.

Here are some more nouns. So the nouns appear, the nouns you saw before. There are some more nouns.

"Rain" is when "wunda," "tip" is "belda," and "curve" is "dalda." And the accusatives are "wunin," "belin," and "dalin." That's unexpected, right, given our theory so far? What do you think is going on? Yes?

AUDIENCE: If you remove the "-da" at the end, [INAUDIBLE].

NORVIN So it's as though you're removing the "-da," right, at the end, yeah? Yes?

RICHARDS:

AUDIENCE: What you think is-- I think it's more than just "-da," because you have "wunda" opposite to "katha."

NORVIN Yeah, we do. We have a minimal pair. It was sneaky of me to put that in there.

RICHARDS:

So there's a "wunda" that means a type of stingray. The accusative of that is "wundan." And then there's another one down here that means rain, and the accusative of that is "wunin." So here I am asking you, how do we get from the nominative to the accusative? Yeah?

AUDIENCE: Is "-da" a morpheme that turns everything else into the nominative?

NORVIN It would be nice, but no. Well, actually that's an interesting way to say it. There's a way to say what you just said
RICHARDS: that would be true. So maybe I shouldn't just say no. Yes?

AUDIENCE: Is the verb actually something else, and they're both being modified to form the causative adjective?

NORVIN So I think you and you-- actually, I'm sorry. I shouldn't have spoken so quickly-- are on the right track. Look, here
RICHARDS: I am saying, how can we get from the nominative to the accusative, right? And the answer is despair, right?
That's what that minimal pair is meant to do.

We had the same thing in Polish, right? Where the word for "lye" and the word for something else were the same in the singular but different in the plural. So we convinced ourselves, all right, we can't predict the plural from the singular. But we can predict the singular from the plural. That's what we decided, right?

So in Polish, we said some of these nouns underlyingly end in "g," some of them underlyingly end in "k." And there's a general rule that "g" becomes "k" at the end of a word. Can we do something similar here? Yes?

AUDIENCE: Also, how do we know that "wunda" is "wunda," the stingray species? Is there some kind of exception to the rule?

NORVIN Could be that, could be that. Two things, it isn't. It's part of a general thing.

RICHARDS:

But also, wait. You're absolutely right. Whenever we're looking at a data set, we could say to ourselves, well, you know what, maybe this is just an exception. Maybe I shouldn't try to account for this. But in this class, you should trust me not to do that to you. So I'm going to give you data sets in which you will be able to come up with rules that account for things.

And in life, that shouldn't be your first move, probably, because-- I don't want to pick on you. It's a move you hear people make a lot. Hey, maybe this is an exception.

But making that your first move is kind of a recipe for failing to make exciting discoveries, right? So if you're willing to exclude certain data, I'm just not going to account for that. Sometimes, that's the way to actually account for everything, is by being willing to recognize exceptions. But other times, what it does is stop you from realizing, no, the exceptions have a general character. We can understand what they all are. So it's worth like-- maybe that can be part of a strategy, corralling all the exceptions into one place and then looking at them all and trying to understand what's going on.

In this particular case, the things that look exceptional right now are "rain," "tip," and "curve." We had this beautiful rule on the basis of the words that were up at the top. And now, these new data are breaking it, right? We want the accusative of "belda" to be "beldan." The fact that it's "belin" is weird.

Is there a way to do the trick that we did for Polish, which was to say the plural is the useful-- is the thing that we can use to predict the singular, right? So we'll start with the plural and then we'll figure out how to make the singular. Can we play that game here? Yeah.

AUDIENCE: Is there a case form now that we don't know, that is, you get something added onto that complement to nominative to form the accusative?

NORVIN So maybe that's a way to think about it. And I think this is more or less what several people have been saying.

RICHARDS: What do you wish the nominative of this was, given our rules?

So we wish that they were "wun," "bel," and "dal," right? Yeah, so I'm just going to write that down, "wun," "bel," and "dal." And then if it were that, well, we would be able to get the accusative, and we would need to do something to get the nominative. Yeah, Vlada?

AUDIENCE: I want to say something about the fact that all of them are one syllable. [INAUDIBLE] for whatever reason.

NORVIN I think that would be very attractive, so I think that is raising a good point. All of the other words that I've shown you, "mela," "barnga," "katha," "wunda," "thungal," "ketharr," "miyar," they're all two syllables long. These words, if there were words like "wun," "bel," and "dal," they would be our first Lardil monosyllables.

RICHARDS:

Now, here's a fact about Lardil. It doesn't have monosyllables. All of its words are at least two syllables long.

So apparently, I think Vlada is absolutely right. Apparently that's being enforced here. So indeed, these words-- a whole bunch of people said versions of this. Let me just channel what you all said-- these words at the end, "rain," "tip," and "curve," they have base forms that don't appear anywhere, in a sense.

Their base forms are "wun," "bel," and "dal," and that's what you add the accusative to, by a totally regular rule. They end in consonants, and so the accusative is in. And then we need another rule that says, "Add -da to monosyllables," something like that. So if you're in danger of having a monosyllabic Lardil word, you add -da to monosyllables. Lardil doesn't like words that are only one syllable long.

This is what's called a minimal word requirement. They're cross-linguistically quite common. There are a lot of languages in the world that don't like their words to be too short. OK? All right, good. So far, so good.

Right, so what we want to do is posit underlying forms, which are often the same as the nominative, but not always. There also these last three that have different forms, OK? Yes?

AUDIENCE: Then, just to clarify, "wun," "dal," and "wunda" are all morphemes?

NORVIN Well, OK. "Wun" is a morpheme. "Wunda" up there, stingray species, is a morpheme.

RICHARDS:

I don't know if we want to call this a morpheme or not. This is why I was reacting the way I was before. It doesn't mean anything, right? It's just there so the word can be long enough. Yeah, that's all it's for.

So I think linguists would mostly not call it a morpheme. It's kind of like we said for Polish, if a word ends with a "g," the "g" becomes a "k." The change from a "g" to a "k" isn't a morpheme. It's part of something that Polish prefers about its words. It doesn't like them to end with "k."

Lardil doesn't like words to be monosyllables, and this is its repair. It's how it fixes that problem. Yeah?

AUDIENCE: I'm confused a little.

NORVIN I don't blame you.

RICHARDS:

AUDIENCE: They don't want monosyllables as words, but they create monosyllable morphemes and build whole verbs on those two [INAUDIBLE].

NORVIN
RICHARDS: Yeah, I totally see what you mean. So let me just repeat what you just said. These people don't like monosyllables, right? And yet their lexicon is full of monosyllables, right? It's as though, I don't know, somebody else gave them their lexicon, right? And then they're doing their best to improve it in the ways that will make them comfortable with it.

Or another way to say it may be when we say they don't like monosyllables, they don't like pronouncing monosyllables. They don't mind monosyllables in their lexicon, but they're not willing to pronounce them that way. They have to do something to them, kind of like Poles don't mind words that end with G as long as they're in their brains, right? It's just saying them. They don't like doing that. They have to do something to them first.

Nice point, actually. This is one of many places in linguistics where you get the feeling that languages are designed by committees which have different priorities, that there's one group of people who are like making the lexicon and another group of people who are like-- I imagine them taking reports from the first committee. And then they're like, "What? You gave us what? Look at all these monosyllables." Yeah? OK.

So going further into Lardil then. Here are some more words. The word for "fish" is "yaka," the word for "string" is "birrka," and the word for "head" is "lelka." And the accusatives are "yakin," "birrkin," and "lelkin."

Is everyone appropriately upset by this? What would we have expected the accusative of "yaka" to be, the word for fish?

AUDIENCE: "Yakan?"

NORVIN
RICHARDS: "Yakan," yeah. What should we do? Yeah, Joseph?

AUDIENCE: Is there a set of consonants that you're not allowed to end the word with?

NORVIN
RICHARDS: Ah, so why do you ask?

AUDIENCE: Well, they all end with an "a."

NORVIN
RICHARDS: So I mean, they don't, right? "Yaka" ends in a vowel and "yakin" ends in an "n," right? Yeah.

AUDIENCE: Supposing that they have-- that the underlying form of "yaka" is "yak," but you can't end it with "k," so you have to put--

NORVIN
RICHARDS: So these three, if we went from the accusative-- what are these three? "Yaka," "birrka," and "lelka." If we went from the accusative, if we started-- if we did the same trick we did with the last three and said, OK, the nominative, I don't understand why the nominative is what it is. But looking just at the accusative, I wish that the underlying form of "fish" were "yak," right? That would work.

So our rule for accusatives would get you the accusatives of "yak." It would be "yakin," and everything would be perfect. And then the question is, why isn't the nominative "yak," to which the answer could be Vlada's answer, it's only one syllable long.

But then why isn't the nominative of "yak" "yakda?" And Joseph had a suggestion about that. "Yak," "birrk," and "lelk" all end in a "k." So maybe I've got two general rule here. It's not add -da to monosyllables. It's add "-da" to, I'll say, most monosyllables. Add "-a" after "k."

I'll say the same thing over here. Add -da to most monosyllables. Add "-a" after "k." OK? Yeah, Joseph?

AUDIENCE: Can you not have two stops in a row? Variable.

NORVIN You cannot have two stops in a row.

RICHARDS:

AUDIENCE: You have to have a vowel?

NORVIN Yup, that would break that. That's right. There aren't any Lardil words that have two stops in a row. Yeah, that's

RICHARDS: true. Yeah? So yeah, "yak," "birrk," and "lelk," OK?

I think this is the last set of Lardil data I was going to show you, if I'm remembering right. No, it's not. There are some others, sorry.

"Kanda" is blood, "nguka" is water, "ngawa" is dog, and "karda" is a kinship term. Lardil kinship terminology is extremely different from ours in ways that would take a long time to explain. But "karda" roughly means a woman's child or a man's sister's child. Yeah, no, I won't try to explain that to you. It's very interesting, but I refuse to talk about it right now.

So the accusative of "kanda" is "kandun," which it shouldn't be, right? It should be "kandan," if it were going to be anything. Do we want the underlying-- I mean, we have a rule that adds "-da." Do we want the underlying form to be "kan?"

No, right? If the underlying form were "kan," what would the accusative be?

AUDIENCE: "Kanin."

NORVIN "Kanin," yeah, and it's not. It's "kandun." So we need another rule. What's the new rule going to say? Yes?

RICHARDS:

AUDIENCE: Just make a guess.

NORVIN Yeah.

RICHARDS:

AUDIENCE: You can't end it in "u," maybe. So you'd have to change everything that ends in a "u" to an "a" in the nominative.
[INAUDIBLE]

NORVIN Right, so we're going to posit underlying forms-- that's nice-- we're going to posit underlying forms like "kandu,"

RICHARDS: "nguku," "ngawu," "kardu." And then we're going to have a rule, change final "u" to "a." So "nguku," underlying "nguku," gives you the accusative "nguku," takes the "n," and you get "ngukun." But there's another rule that says, change final "u" to "a," that in the nominative changes "nguku" to "nguka." Yeah? OK, good.

And then-- yup? All right. And then I think this is the last set of data I wanted to show you. The word for "story" is "ngalu," the word for "boomerang" is "wangal," the word for "kookaburra" is "thalkurr," and the word for "umbilical cord" is "kundul," but the accusatives are "ngalukin," "wangalkin," "thalkurrkin," and "kundulkin." What's the underlying form of these?

You guys all know the drill by now. It's like, take the accusative, subtract the accusative suffix. So what should the accusative of "umbilical cord" be? Sorry, what should the bare form of "umbilical cord" be? "Kundulk," yeah? "Kundulk."

So we would expect "kundulk," "thalkurrk," "wangalk," and "ngaluk." And there's something that says, drop final "k." So "kundulk," we start with "kundulk," and we form the accusative off of that. But if it's nominative, we get rid of the final "k." Yes?

AUDIENCE: What happened to "birrka?"

NORVIN What happens what?

RICHARDS:

AUDIENCE: What happened to "birrka?"

NORVIN I missed it again.

RICHARDS:

AUDIENCE: Why is that not "birrka?"

NORVIN Why is--

RICHARDS:

AUDIENCE: I think it's one way.

NORVIN Oh, the word for string or whatever it was, "birrka," which started off as "birrk." And we asked, why aren't we dropping the final K? Yeah, you're asking exactly the right question-- or similarly, "ngalu."

RICHARDS: We just came up with a rule that changes final "u" to "a," right? But the word for story is not "ngala." It's "ngalu." Yeah?

AUDIENCE: Do we have to specify that dropping the final "k" applies to underlying forms internal to swap it?

NORVIN So we might have to say something. We either have to work on our rules-- you're absolutely right-- and make

RICHARDS: them more specific than that. That's one kind of thing we could do. Yes?

AUDIENCE: And I'm wondering if there's some kind of like declension system. Like, I'm thinking if like I had to study Lardil-- some kind of declension system.

NORVIN

RICHARDS:

So we couldn't do that for Lardil. We could say, you know what, there are nouns that do one of these, and then there are nouns that do another set of these. So there are rules that apply to particular classes of nouns. We could absolutely say that, yeah.

Here's another thing we could do, though. So here's-- just to stick to the case that you were worried about just a second ago-- What did I do with my chalk? I guess I took it over there.

We've got words like "birrk," that means string, underlying "birrk." And then we've got words like underlying "kundulk." That means umbilical cord, right?

And with "birrk," what we do is add "a" because-- so what we do is add "a." But with "kundulk," what we do is get rid of the final "k." So these two words are undergoing different types of rules, different sets of rules.

Or similarly, we had a word, "kandun." Here, let's do blood, "kandun." And that, the "u," changed to "a." So we've got "kanda."

But now we've got a word which is underlying "ngaluk." And what's happening there is that you're dropping the final "k." So you've got "ngalu." But you don't change the final "u" to an "a."

So we have these rules that seem to apply to certain bodies of examples. And your suggestion, which seems attractive, is maybe these rules need a little bit of work. Maybe we need to get them to be more specific so they only apply to certain kinds of things.

But here's another way to think about this, and I'll leave you with this. So here are the rules, some of the rules. So yeah, the word for "head" starts off as "lelk." And we add "a" because of rule two, so we get "lelka."

But this is what we're asking, the kind of thing we're asking. You start with "lelk." Why don't you apply the rule four to get "lel," and then maybe rule one, so you'd get "lelda?"

Or you start with "ngaluk." You apply rule four, so you're getting "ngalu." Why don't you then apply rule three to get "ngala?" These are the kinds of questions that we're asking.

And one kind of response to this kind of problem that people have classically given is to not only have rules but to have the rules apply in an order, that is, to have what's called rule ordering. It's as though there's an assembly line between one of these committees and the other. So rule two and rule three happened before rule four.

So if you are starting with "lelk," the basic form for "head," you first apply rule two and get "lelka." Having applied rule two, which adds the "a" after "lelk," you're not in any danger of applying rule three or rule four. And rule three, never mind, but rule four, which would have gotten rid of a final "k," doesn't apply anymore because, well, there isn't a final "k" anymore.

Or "ngaluk," which is the base form for story, rule four happens after rule two and rule three. So rule four gets rid of the "k" and gives you "ngalu." And you can imagine now at this point, the rule three people are like, hey, give us that word. We want to get rid of that "u."

But it's too late. Rule three has had its time. You don't get to apply it anymore.

So this is one way of handling these kinds of problems, is to see, these rules that change things, they're not just rules that change things. They're rules that apply in an order. There's a series of processes that you apply. And you have to apply them in the correct order, and not in the incorrect order, to get the result. Joseph?

AUDIENCE: So it's better to do these like a series of rules that are all applied simultaneously, in a sequential if/else statement.

NORVIN Right.

RICHARDS:

AUDIENCE: And when you're done, you need to [INAUDIBLE].

NORVIN That is a way to think about this, yes, a classic way. We'll talk about other ways to think about this kind of

RICHARDS: problem, but this is one. All right, let's stop there.